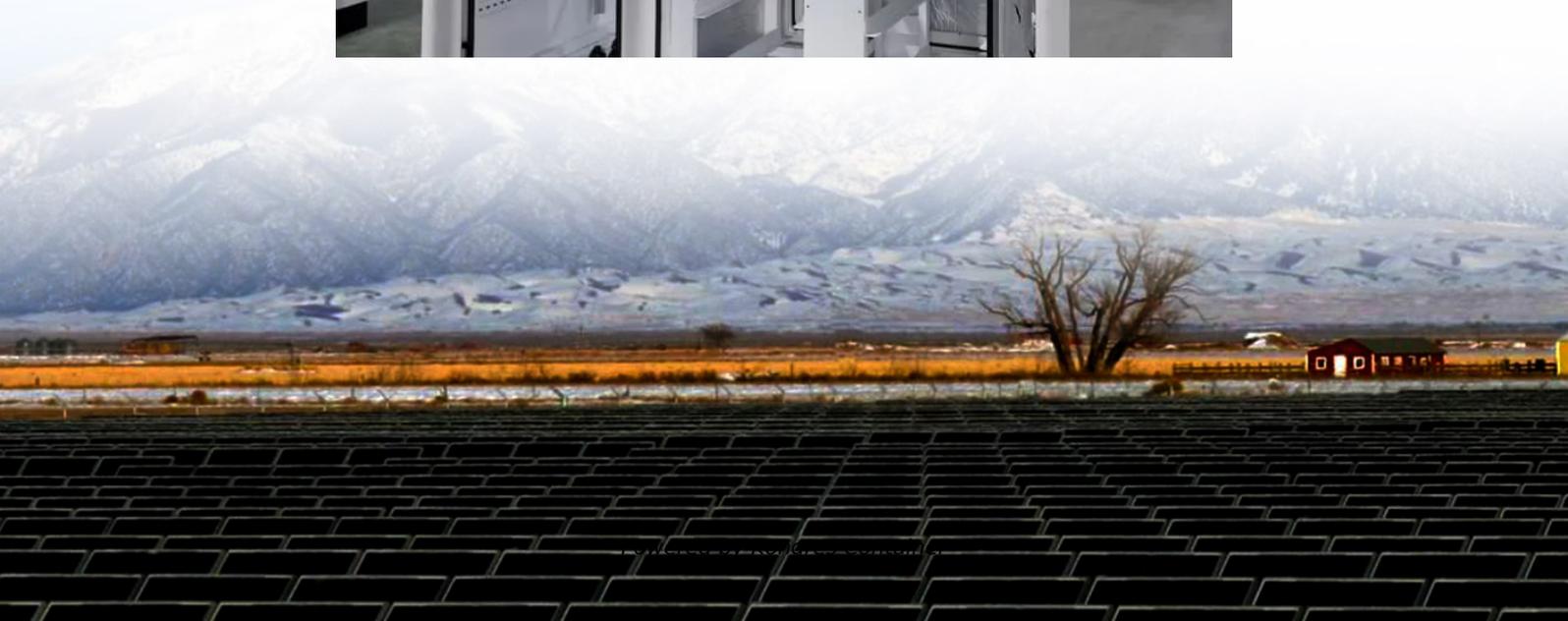


## Kongres Container

# The power grid prioritizes centralized energy storage



## Overview

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Historic amounts of energy storage, primarily lithium-ion battery systems, are being added to the U.S. grid, driven by a need to balance renewable generation and to meet load growth, including from data centers.

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Energy storage has a pivotal role in delivering reliable and affordable power to New Yorkers as we increasingly switch to renewable energy sources and electrify our buildings and transportation systems. Integrating storage in the electric grid, especially in areas with high energy demand, will.

Jon-Edward Stokes (PME '30) examines future energy storage technologies to enable a more reliable and sustainable grid. By Jon-Edward Stokes In the US, about 59% of electricity was generated from fossil fuels in 2024. Of that fossil fuel-generated electricity, approximately 73.3% came from natural.

The U.S. electric grid is an engineering marvel with more than 9,200 electric generating units having more than 1 million megawatts of generating capacity connected to more than 600,000 miles of transmission lines. The electric grid is more than just generation and transmission infrastructure. It.

The grid is transitioning from a more static system with centralized electricity generation and management operations to one that is more dynamic and adaptable, where consumers also play a role in managing generation and consumption to help balance the grid. One game-changing technology that is.

Historic amounts of energy storage, primarily lithium-ion battery systems, are being added to the U.S. grid, driven by a need to balance renewable generation and to meet load growth, including from data centers. A series of fires at lithium-ion facilities, particularly in California and New York.

Grid-scale storage refers to technologies connected to the power grid that can store energy and then supply it back to the grid at a more advantageous time

- for example, at night, when no solar power is available, or during a weather event that disrupts electricity generation. The most widely-used. Why are energy storage systems being added to the grid?

Historic amounts of energy storage, primarily lithium-ion battery systems, are being added to the U.S. grid, driven by a need to balance renewable generation and to meet load growth, including from data centers.

Should energy storage be included in the electric grid?

Integrating storage in the electric grid, especially in areas with high energy demand, will allow clean energy to be available when and where it is most needed. As New York continues to invest and build a cleaner grid, energy storage will allow us to use existing resources more efficiently and phase out the dirtiest power plants.

What is grid-scale storage?

Grid-scale storage refers to technologies connected to the power grid that can store energy and then supply it back to the grid at a more advantageous time - for example, at night, when no solar power is available, or during a weather event that disrupts electricity generation.

What are the benefits of a modernized grid?

Consumers can better manage their own energy consumption and costs because they have easier access to their own data. Utilities also benefit from a modernized grid, including improved security, reduced peak loads, increased integration of renewables, and lower operational costs.

Will energy storage change the dynamics of a grid?

With widespread grid failures on this scale, energy storage would have to make up a much larger share of system capacity than it currently does to change the dynamics, although it can respond to sudden system fluctuations by providing ancillary services, like frequency and voltage regulation.

How do energy storage and demand response affect the grid?

As a result, the grid has historically relied on more flexible resources, such as natural gas or hydropower, to meet sudden changes in demand. Energy storage and demand response add additional flexible resources to the system operator's toolkit, providing them with more options for balancing the grid.

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